(No Model.) 2 Sheets—Sheet 1.

J. & H. R. HOWARD.

POWER BRAKE FOR RAILWAY CARS.

No. 458,807. Patented Sept. 1, 1891.

Fig. III.

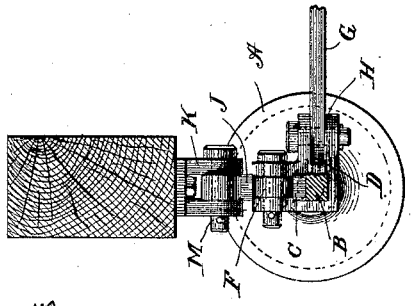


Fig. I.

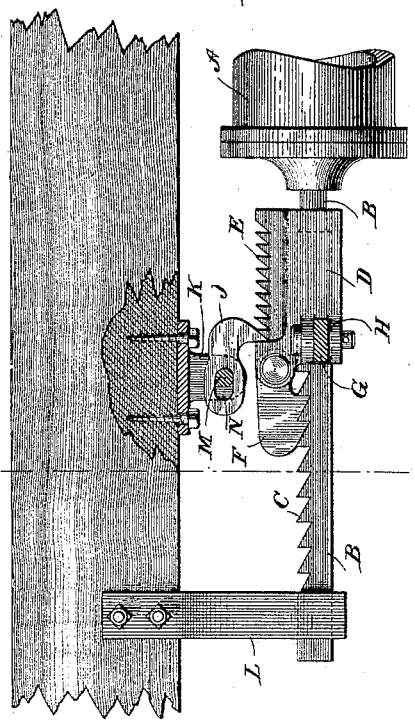


Fig. II.

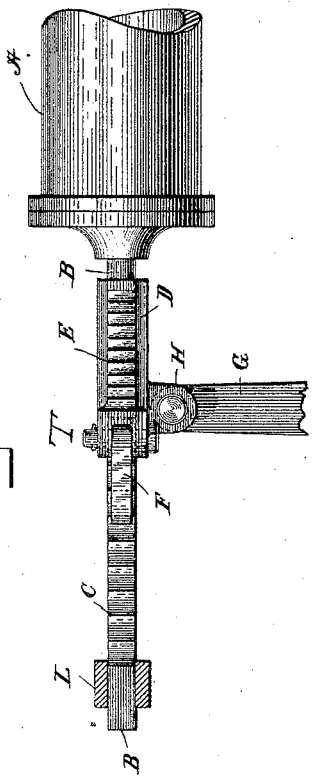
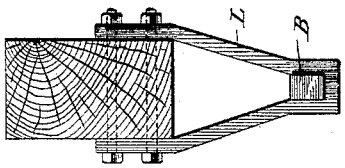


Fig. IV.



Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

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Fig. V.

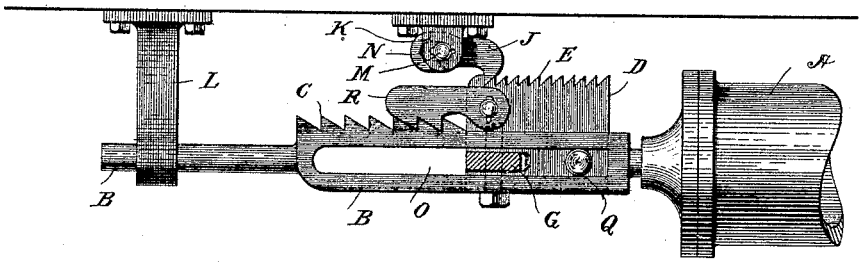


Fig. VI.

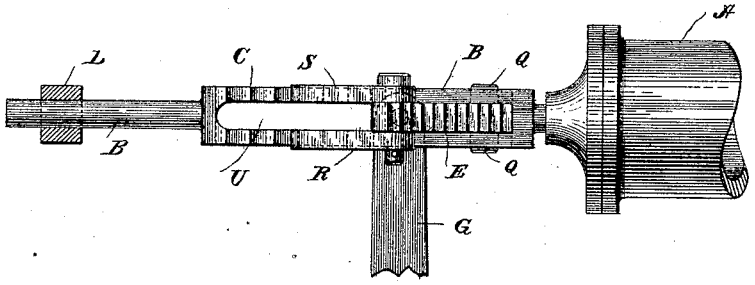
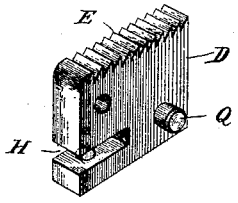


Fig. VII.



Witnesses.
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UNITED STATES PATENT OFFICE.

JAMES HOWARD AND HERBERT RUSSELL HOWARD, OF NEW YORK, N. Y.

POWER-BRAKE FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 458,807, dated September 1, 1891.

Application filed December 10, 1890. Serial No. 374,139. (No model.)

To all whom it may concern:

Be it known that we, JAMES HOWARD and HERBERT RUSSELL HOWARD, subjects of Her Majesty the Queen of Great Britain, and at present residing in New York, in the county and State of New York, have jointly invented certain new and useful Improvements in Power-Brakes for Railway-Cars, of which the following is a specification.

Our invention is an improvement in power-brakes; and it consists of an automatic "take-up" for taking up the slack in the brake-gearing. Slack is caused by the wear of the brake-shoes, and if not constantly taken up there occurs a loss of time and power in applying the brakes, for if allowed to accumulate it will exhaust the stroke of the piston of the motor-cylinder. This condition of the brakes is a highly-dangerous one, because, so far as appearances go, they seem to be applied with force, but owing to the slack having exhausted the stroke of the motor-cylinder the brake-blocks are merely carried to the wheels, but receive no effective pressure, and it often happens that this is only discovered when too late to avoid an accident.

Our invention consists of a single rod or a slotted bar, which may be placed in any convenient intermediate position between the brake-shoes and the motor-cylinder. Preferably we attach it to the piston-rod of the brake-cylinder. This rod or bar has a sliding block upon it, which carries or is attached to the main lever of the brake-gearing. Both the rod or bar and the sliding block are armed with teeth, which operate suitable pawls and by their conjoint action in connection with the motion of the piston of the brake-cylinder they always keep the brake-shoes close to their work and at the same time leave the full stroke of the piston free for every application of the brakes, so that no time is lost when the engineer moves the brake-valve, and the brakes are at once applied with full force. This will be better understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the mechanism constituting the take-up made the subject of this application. Fig. 2 is a plan view of the same, the upper bracket and pawl being omitted for convenience of illustration. Fig. 3 is an end elevation of same. Fig. 4 is an end view of the guide hereinafter referred to. Fig. 5 is a side elevation of a modified form of mechanism embodying the invention, the modification referring particularly to the slotted ratchet-bar extending from the piston-rod of the motor-cylinder. Fig. 6 is a plan view of the same, and Fig. 7 is a detached perspective view of the sliding block hereinafter referred to.

Fig. 1 is a side elevation of the take-up, showing the motor-cylinder A, the rod B, having teeth C and supported by the guide-bracket L, the sliding block D, which slides upon the rod B, having teeth E, and pawl F, resting in teeth C. Sliding block D is attached to the main brake-lever G, (shown in section in the jaw H of block D.) Pawl J is attached to any suitable part of the car-body by means of a bracket K and pin M, which pin works in slot N of pawl J. Pawl J also works in teeth E of sliding block D.

Fig. 2 is a plan view of the take-up with bracket K and pawl J removed for convenience of showing arrangement. Sliding block D is made hollow, so that rod B works through it. L′ is a section of the guide L, Fig. 1.

Fig. 3 is an end view of the take-up, showing bracket K, carrying pawl J, and sliding block D or rod B, with attachment to main brake-lever by jaw H, and end view of pawl F.

Fig. 4 is an end view of the guide L, showing end of rod B in position.

Fig. 5 is another arrangement of the take-up, showing a slotted bar B instead of a single solid rod, viz: A horizontal slot is shown in Fig. 5 at O and a vertical slot is shown in Fig. 6 at U. The sliding block D works in these slots, being held in position by the pin Q and the main brake-lever G. In this case the sliding block D would carry two pawls, as shown in Fig. 6 at R S.

Fig. 7 is a view of sliding block D, showing jaw H and pin Q and teeth E. It is evident that this arrangement of take-up need not be placed in direct communication with the piston-rod of the brake-cylinder, but that it will work equally well in any intermediate position in the brake-gearing, where suitable motion may be obtained for it.

The operation of the take-up is as follows: As the admission of power to the brake-cylinder drives the piston-rod out of the cylinder A, the rod B, moving in unison, will, by means of its teeth C, drag the pawl F in the same direction with them, and pawl F, being attached to the movable block D by the pin T, is also drawn forward by the same means, and block D being attached to the main brake-lever at H the brakes are thereby applied. If there be any slack in the brake-gearing, then block D will be moved forward, carrying main brake-lever G with it, until all slack is taken up, and while this is taking place the teeth E in block D being set in the opposite direction to teeth C in the rod B the pawl J will slip over them and only come to rest when all slack is taken up. Upon the release of the brakes the piston-rod is left free to return into the cylinder and rod B slips back with it, the teeth in rod B being so inclined that the pawl F slips over them, leaving block D engaged by pawl J; but pawl J has a slot N just large enough to allow the brakes to be released from the wheels by slipping on pin M. After this has taken place the brakes are held close to their work until enough is worn off the brake-shoes to permit of taking up another tooth on the block D, and so on till the brake-shoes are worn out.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In combination with power-brakes, a ratchet-bar extending from the piston-rod of the motor-cylinder, the toothed sliding block carried by said ratchet-bar and having a pawl engaging the same, and a pawl carried by the car-body for engagement with said toothed sliding block, substantially as set forth.

2. In combination with power-brakes, a single or a slotted bar having teeth upon it and carrying upon itself a sliding block with pawls attached, which pawls are operated by the teeth in the bar, the sliding block also having teeth upon it and having the main lever of the brake attached to it, and a pawl having a slot in it and so attached by means of a bracket to the car-body as to work freely in the teeth of the sliding block, the slot in the pawl governing the release of the brakes, substantially as described and shown.

3. In combination with power-brakes, the take-up, substantially as described and shown, having rod B, with teeth C, sliding block D, with teeth E and pawl F and carrying main brake-lever G, pawl J, with its slot N, and pin M in bracket K and support L.

Signed this 23d day of January, 1890, at New York.

JAMES HOWARD.
HERBERT RUSSELL HOWARD.

Witnesses:
R. A. PORTEOUS,
E. D. MILLER.